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2 July 2020

VIA EMAIL

Mr. Brandon Pursel
U.S. Environmental Protection Agency, Region 5
77 West Jackson Boulevard
Chicago, IL 60604

Re: Transmittal of Review Comments
Remedial Study Report for the Steel Slag Processing Area (January 2020)
ArcelorMittal Indiana Harbor West, East Chicago, Indiana
Mabbett Project No. R7065000.006.001.003

Dear Mr. Pursel:

Under Contract No. 68HERH19D0019, Task Order No. 68HE0520F0058 and as specified in a Technical Direction Memo dated May 8, 2020, Mabbett & Associates, Inc. (Mabbett®) has completed a technical review of the subject document. Our comments on this document are provided as an attachment to this letter. The technical review of the *Remedial Study Report for Former Coke Plant Area*, also included in the scope of the May 8, 2020 Technical Direction Memo, is ongoing and will be provided to you before August 1, 2020.

We appreciate the opportunity to support EPA on this project. If you have any questions or require additional information, please do not hesitate to call or email either of the undersigned.

Very respectfully,

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TECHNICAL REVIEW
REMEDIAL STUDY REPORT FOR THE
STEEL SLAG PROCESSING AREA
JANUARY 2020

ARCELORMITTAL INDIANA HARBOR WEST
EAST CHICAGO, INDIANA

July 2, 2020

In response to Task Order No. 68HE0520F0058 under EPA Contract No. 68HERH19D0019, Mabbett & Associates (Mabbett) conducted a review of the January 2020 *Remedial Study Report (RSR) for the Steel Slag Processing Area (SSPA)* at the ArcelorMittal West (AMW) facility in East Chicago, Indiana. The RSR presents a summary of site conditions and evaluates potential corrective measures for light nonaqueous phase liquid (LNAPL) impacts in slag-fill soil and groundwater at the SSPA. Based on this evaluation, the RSR recommends no further investigation or remedial action for the SSPA other than timely implementation of institutional and engineering controls. Mabbett's review focused on technical adequacy of the evaluation and conclusions. Comments developed during this review are presented below.

I. GENERAL COMMENTS

1. The second paragraph in Section 1 states that the purpose of the RSR is "to evaluate corrective measures for the site and to recommend the corrective measure to be taken to address LNAPL impacts at the site." The RSR provides a fairly robust evaluation of risks associated with LNAPL in the subsurface and potential corrective actions to address those risks. However, the RSR largely overlooks exceedances of Indiana Department of Environmental Management (IDEM) screening levels for benzene and benzo(a)pyrene in the slag fill and dissolved-phase benzene in groundwater. The RSR should be expanded to include greater detail on corrective measures that could be used to address this contamination, both within the LNAPL footprint and outside the immediate area in the vicinity of well MW-509S. Even if the dissolved-phase contamination at well MW-509S is isolated and unrelated to the LNAPL mass, the RSR must document that potential risks associated with contamination across the SSPA will be adequately addressed by the proposed remedy.
2. The RSR satisfactorily documents that the LNAPL mass is largely immobile in the subsurface at the SSPA. However, there is no discussion of the LNAPL mass as a continuing source of dissolved-phase contamination through partitioning. Based on the lack of extensive downgradient dissolved-phase contamination, it appears that partitioning of contamination from the weathered LNAPL may not be a significant concern under current conditions. Nevertheless, the active corrective measures evaluated in the RSR are designed to alter the chemical and/or physical characteristics of the LNAPL mass which is likely to affect the rate of contaminant partitioning into the dissolved phase. Accordingly, each potential treatment technology evaluated in the RSR should be specifically assessed for potential influences on the dissolved-phase footprint and ability to address such contamination in addition to LNAPL.
3. Each of the potential corrective measures evaluated include 7 years of groundwater monitoring. According to Section 7.1.2.5 of the RSR, this duration "reflects a reasonable time frame that may be necessary to demonstrate stable or decreasing volatile organic compound (VOC) concentrations in groundwater site-wide." Additional justification for this duration should be provided, and the RSR should discuss decisions to be made based on the resultant data. It is preferable to discuss the duration of the groundwater monitoring

program in terms of contaminant concentration targets rather than a set number of years. For example, if data confirm continued natural source zone depletion (NSZD) of LNAPL and natural attenuation (NA) of dissolved-phase contaminants, a reduced monitoring frequency may be appropriate (e.g., five-year reviews). If dissolved-phase contaminant concentrations drop and remain consistently below IDEM-established closure levels, it may be appropriate to discontinue laboratory analysis and only monitor for the presence of LNAPL. Alternatively, if monitoring data indicate unexpected migration of the LNAPL or an expansion of the area containing dissolve-phase exceedances, additional investigation and/or more active intervention may be required. Revise the RSR to include a performance-based approach for groundwater monitoring, keeping the presumed 7-year duration for cost estimating purposes only.

4. Section 4 of the RSR lists three corrective action objectives (CAOs) for the SSPA:
   - Meet the conditions described in the CA725 and CA750 Environmental Indicators (EIs);
   - Prevent drinking water and construction worker exposures to contaminated groundwater where risk-based concentration goals cannot be achieved in a reasonable time period; and
   - Prevent exposure to volatile constituents in outdoor or indoor air.

   Additional discussion of these CAO drivers is required, particularly in the comparative analysis in Section 8. Expand the RSR to specifically indicate whether and how each of the four retained corrective measures will contribute to achievement of the CAOs. For example, the RSR should discuss whether the CA725 and CA750 EIs have been achieved (i.e., human exposures and migration of contaminated groundwater are under control); if not, the RSR should explain how each corrective measure would contribute to positive determinations in the future. Regarding the second CAO, it would be beneficial to discuss the time frame for actively reducing LNAPL mass and achieving IDEM screening levels; projected time frames for LNAPL mass removal via NSZD and NA of dissolved-phase contamination to levels below IDEM closure values should also be noted. As the third CAO is most closely associated with dissolved-phase contamination in the vicinity of well MW-509S, the RSR should consider potential corrective measures for that area and assess potential effectiveness at preventing indoor air exposures. The RSR should also be expanded to address potential outdoor air exposures across the SSPA in alignment with the third CAO. Revise the document accordingly.

5. The current status of LNAPL and dissolved-phase contamination at the SSPA should be reassessed prior to finalizing the RSR and its recommendations, given that the most recent data available are approximately three years old (September 2017). Use of a dated baseline is inappropriate. If more current groundwater monitoring results are available, that data should be provided to EPA for review.

6. To accelerate implementation of institutional controls (ICs) for the SSPA, we recommend that the RSR be expanded to include an appendix with draft language for the proposed groundwater use restriction and deed restriction. All information needed to develop those drafts is currently available, presuming that the language will be confirmed with current groundwater monitoring data prior to finalization. Additionally, the deed restriction should be developed to explicitly prohibit intrusive activity at the SSPA by future property owners (who would not be subject to ArcelorMittal's dig permit program) without a reassessment of risk and required worker protections

II. SPECIFIC COMMENTS

1. **Section 2.4, Site Hydrogeology, Page 3.** The second paragraph in this section indicates that shallow groundwater flow direction is to the north-northwest. Section 3.2 indicates that the groundwater flow is generally to the north-northeast across the SSPA, but north-northwest in the eastern portion of the site near well MW-509S. Figure 2-1 shows flow moving north and north-northeast across the entire SSPA. For clarity,

revise the text in both sections to conclude that shallow groundwater flow direction is variable over time but generally ranges from north-northeast to north-northwest in this area.

2. **Section 2.5.2, Groundwater Quality, Page 4.** The RSR defines the 400-foot by 200-foot area highlighted on Figure 2-4 as "the LNAPL area." The first paragraph in this section discusses benzene exceedances in the LNAPL area and then states that "the detected benzene concentrations outside the LNAPL area did not exceed the default closure data quality objectives." This statement is contradicted by the second paragraph in Section 2.5.2, which highlights benzene exceedances at well MW-509S – outside the LNAPL footprint. Clarify the first paragraph in Section 2.5.2 to state that "*except in the vicinity of well MW-509S*, the detected benzene concentrations outside the LNAPL area did not exceed…."

3. **Section 2.5.2, Groundwater Quality, Page 4.** Revise the third sentence in this section to clarify that benzene concentrations detected in 2016 and 2017 ranged from 5.3 to *160* micrograms per liter (µg/L), with the maximum value having been reported at well MW-503SR in September 2016. The same error should be corrected in the second sentence of Section 5.4.2.1 (page 12).

4. **Section 5.4.1.1, LNAPL Stability, Page 10.** Figure 3-2 indicates that LNAPL thicknesses are generally less than two feet when the water table rises above *582* feet above mean sea level. Correct the last sentence in the first paragraph on page 10 to reflect this elevation.

5. **Section 5.4.2.2, Vapor Intrusion Pathway, Page 13.** Expand the first paragraph of this section to note that vapor intrusion potential will be reassessed if the property is transferred to a new owner (as stipulated in the proposed deed restriction) *or if buildings/enclosures will be constructed or expanded at the SSPA*. Also, revise the reference in the third sentence of this paragraph to cite Section 5.4.2.1 of the RSR, rather than Section 4.4.2.1.

6. **Section 5.4.2.2, Vapor Intrusion Pathway, Page 13.** The second paragraph in this section assesses the potential for indoor air exposures within Buildings 161 and 187. As written, the RSR refers to an IDEM groundwater screening level of 1,200 µg/L and an attenuation factor of 0.0001. However, Table A-6 of the IDEM Remediation Closure Guide (RCG) lists the screening level for benzene exposures via vapor intrusion from groundwater as 120 µg/L. Dividing that value by the standard attenuation factor of 0.001 for commercial buildings – as directed in Section 10.4 of the RCG – brings the adjusted screening level to 120,000 µg/L. (Current site conditions at the two buildings may warrant use of the 0.0001 attenuation factor, as suggested in the RSR.) Nevertheless, even the more conservatively calculated screening level is three orders of magnitude higher than the highest benzene concentration reported in well MW-509S (140 µg/L). Revise the discussion to reflect correctly adjusted screening values. These same corrections should be made in the Vapor Intrusion Pathway discussion on page 27.

7. **Section 5.4.3.1, Estimated LNAPL Transmissivity, Page 15.** Clarify the third sentence on page 15 by noting that 0.8 square feet per day is the minimum transmissivity value for practicable LNAPL recovery *by hydraulic or pneumatic methods*. As stipulated in the Interstate Technology and Regulatory Council guidance document entitled *Evaluating LNAPL Remedial Technologies for Achieving Project Goals*, additional mass removal may be achievable via other treatment methods that alter the chemical or physical nature of the LNAPL.

8. **Section 6.3, Technology 1 -- Hydraulic Containment, Page 16.** Hydraulic containment is an environmental cleanup technique that seeks to keep contamination from migrating in an uncontrolled manner. Given the stable footprint of groundwater contamination at the SSPA (including around well MW-509S), hydraulic containment does not appear to be necessary except as a component of other remedial technologies that alter the nature of the LNAPL and enhance contaminant partitioning and/or mobility. Because the approach

detailed in Section 6.3 relies on hydraulic extraction (i.e., pump and treat), revise the section title for clarity on what is being considered.

9. **Section 7, Evaluation of Corrective Measure Alternatives, Page 19.** Revise the fourth sentence in this section to refer to Table 8-1 for a comparative analysis of the four retained corrective measures against the RCRA threshold and balancing criteria.

10. **Section 7.1.2.5, Cost, Page 22.** The last paragraph in this section discusses the common element of groundwater monitoring which will be included as a component of all four potential corrective measures alternatives. Expand this discussion to include the list of monitoring wells to be sampled for laboratory analysis and wells to be monitored for LNAPL thickness. As noted in Section 5.4.3.2 (page 15), well MW-504SA has a bent well casing and is no longer accessible for monitoring purposes. Analytical parameters should also be specified.

11. **Section 7.1.2.5, Cost, Page 22.** This section of the RSR should clarify that ICs and engineered controls (ECs) will be implemented as a common element in each of the more active corrective measures under consideration (unless ArcelorMittal believes that the remedies could accomplish cleanup to levels that would no longer require such controls). An Option 1 cost table should be provided in Appendix B to address IC/EC implementation, legal costs, reporting, and monitoring. Based on costs outlined in Appendix B, it appears that the IC/EC and groundwater monitoring option would cost at least $300,000, rather than just the $20,000 listed in Table B-1. Cost tables for Options 2 through 4 in Appendix B should also be expanded to also account for IC/EC implementation costs.

12. **Sections 7.3 through 7.5, Corrective Measures, Pages 22 through 25.** These sections should be expanded to include discussion of proposed end points for each potential technology option and the anticipated time frame for achievement of those targets. The RSR should also consider the ability of each corrective measure option to address soil contamination, dissolved-phase groundwater contamination, and LNAPL mass. Without knowing these details, it is impossible to assess how effectively and expediently each option could address environmental contamination at the SSPA. These sections should also discuss how each corrective measure option will move the site toward achievement of the specified CAOs.

13. **Appendix B, Estimated Corrective Measure Costs.** Cost tables in this appendix need to be supported with backup detail and assumptions used in generating the various estimates. The lump sum costs currently provided need to be broken down into components to facilitate review.

14. **Appendix C, Table C-1, SSPA LNAPL Plume Evaluation Flowchart.** Improve this flowchart's applicability to the SSPA by highlighting the current flow path and noting that, should site conditions change over time, a different flow path may be required.